Work Order I October-01-12 3:30.		53			*900	)53*	*		* * *	, <sub>7</sub> , 2, 2		Page 1
Revision ID:	2-664-201		- 12 - 2 - <b>2</b> 1 - 2 - 8 -		Accept	*N900	<b>104</b> 0	)10	<b>n</b> *	Setup Sta	1.71	S1*
Item Name: Cros	stube Turnii	ng Detail		: 🌣			939 r. gb -2 8 -2 91	Barry M		Sto	<sup>p</sup> *N	S2*
		Start Qty: 1.00		*1*		Cust Item	iD:					
Required Date: 16/1	0/2012	<b>Req'd Qty:</b> 1.00	0	*1*		Customer	:					
Reference:			-	•			•					
Approvals: Pro	cess Plan:	MLJ	Date: /2	2-10-0	( Tooling:		Date:		Ī	Run Sta	I/J	R1*
g QC	::		Date:	<i>/</i>	SPC (Y/N):		Date:			Sto	*N	R2*
Sequence ID/ Work Center ID		Operation Description			Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revisi	on Nbr				<del></del>	-		<del></del>	* * .		
D212-664-241	Rev D				420 Cm			* * *		. '		
100 *100* Mori Seiki		MORI SEIKI CNC L			0.00	The State of the S	V V		o	-Ø-	-	
Mori Seiki CNC Lathe Lar	ge	1-Fill tub	be with sand & ins	stall plugs DT	8534 on both ends as pe	r Folio FA114		<b>.</b>				anon
		3-Blend a FOLIO R DWG RE *Use mil	transition lines on REV: A D EV: D Il bastard file, brus use sandpaper coa	ly, **do not s	dly with file card.	To Dep			ng .			anon.
*110 *11 <b>0</b> *	Q	C1- Inspect dimensi	ions to dimension	sheet	0.00		Tar Tar	n d	1	6		, 3 ,
QC Quality Control	energy type, e	Memo	1883 1873		. 0.00 //			Mayor S			- 4	mand

			DQ	<b>A:</b> Date:	
NCR:	Yes / No	WORK ORDER NON-CONFORMANCE /	/ UPDATE		

								-		QA Closed:	Date	2:
Work Orde	**	•			DISPOSITION				AGAINST DE	PARTMENT	/PROCESS	
Part N					Rework Scrap Use-as-is	]   		Skid-tube Machining noforming	Crosstube Small Fab Finishing		Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR N	0				Work Order Update	]   "		Large Fab	Composite		Supplier	
Root				Descri	ption of work order update	Initia	al	Ac	tion	Sign &		
Cause	Date	Step	Qty		or Non-conformance	Chief	Eng	Desc	cription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved							· ·					
<u></u>	<del> </del>				F	AULT C	ATEC	GORY				
Landin	g Gear				General					_		<del></del>
	Bending Centre No Cracks Crushed/0			o/s	Bend BOM/Route Broken/Damaged Burrs	Inst	rdwai pectio tructi	on Incomplete ions Incomplete/	/Unclear	Ovalized Over/Under Part Incorre Part Lost/Mi	ct	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled
-	Cuffs				Contamination	<b>—</b>		nance		Part Moved		
	Heat Trea Inspection Ripples in	n Strip in	Tube		Countersink Cut Too Short Drill Holes	<del></del>	slabe sread set			Positioned V Power Loss/	_	Other
	Torque W	aves in E	xtrusio	n 🗀	Drawing	<del></del>		alibration				
	Turning So Wave/Tw	-			Finish Folio	$\vdash$		equence Dimensions				

Page 2 October-01-12 3:30:09 PM Item ID: D212-664-201TRN Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 01/10/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 16/10/2012 **Req'd Qty:** 1.00 **Customer:** Reference: Run Process Plan: \_\_\_\_ Date: Approvals: **Tooling:** Date: \_\_\_\_\_ Date:\_\_\_\_\_ SPC (Y/N): Date: Sequence ID/ **Operation** Set Up/ Tool ID Tool # Plan Accept Reject Reject Insp. Work Center ID Description **Run Hours** Code Qty Qty Number Stamp 120 0.00 MORI SEIKI CNC LATHE LARGE \*120\* Mori Seiki 0.00 Memo Mori Seiki CNC Lathe Large 1-Turn second side as per Folio FA114 2-Blend transition lines only, \*\*do not sand whole tube\*\*: \*Use mill bastard file, brush file repeatedly with file card. \*Do not use sandpaper coarser than 320 grit. FOLIO REV: DWG REV: 3-Remove sand and plugs 4- scribe batch # and part # as per dwg 130 QC1- Inspect dimensions to dimension sheet 0.00 QC

K/mgm1 12/63/13

Quality Control

Memo

0.00

										DQA:	Date:	
NCR:	Yes / No				WORK ORDER NON-O	CON	IFOR	MANCE / UPD	DATE	QA Closed:	Date:	
Mark Ord					DISPOSITION				AGAINST DE			
Work Orde				<del> </del>	Rework			Skid-tube	Crosstube	] _	Water Jet	Engineering
Part N	No		***************************************	,	Scrap Use-as-is			Machining noforming	Small Fab Finishing	-	d. Eng. Coor re/Packaging	Quality Other
NCR N	No			<del></del>	Work Order Update			Large Fab	Composite		Supplier	
Root				Descri	ption of work order update	lr	nitial	Acti	ion	Sign &		
Cause	Date	Step	Qty	(	or Non-conformance	Chi	ief Eng	Descri	iption	Date	Verification	QC Inspector
Doc/Data												
Equip/Tooling												
Operator												
Material												
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Other		1										
Process												
Supplier												
Training						ļ						
Unapproved		<u> </u>				<u> </u>				ļ		<u> </u>
		-				AUL'	T CATE	GORY				
Landi	ng Gear			<del></del>	General				<u> </u>	1 .	<del>[</del>	
	Bending			ļ	Bend	$\vdash$	Grain		<u></u>	Ovalized		Pressure/Forced
	Centre N	ot Conce	ntric to	o/s	BOM/Route	$\vdash$	Hardwa			Over/Under	<del></del>	Temperature/Cure
ļ	Cracks				Broken/Damaged	-		on Incomplete	. —	Part Incorre	<del></del>	Weld
ļ	Crushed/	Crimped.			Burrs	$\vdash$		ions Incomplete/U	Inclear	Part Lost/Mi	ssing	Wrong Stock Pulled
·	Cuffs				Contamination	-	Mainte		<u> </u>	Part Moved		
	Heat Trea	at			Countersink	Ш	Mislabe	led	<u> </u>	Positioned V		٦
	Inspectio	n Strip in	Tube		Cut Too Short	Ш	Misread	j		Power Loss/	Surge	Other
141 4	Ripples in	շ Bend	. w stone	carte 1944	Drill Holes		Offset				A Maria	

Out of Calibration

Out of Sequence

Outside Dimensions

Ripples in Beng
Torque Waves in Extrusion
Turning Sequence
Wave/J.wist-in-Lube
H:/FORMS/Quality Assurance\approved:QA/NgRWO Rev G

Drawing

Finish

Page 3

October-01-12 3:30:09 PM

Item ID: D212-664-201TRN **Revision ID:** 

Accept

\*N900040100\*

Setup Start

Item Name: **Start Date:** 

Crosstube Turning Detail

**Required Date:** 16/10/2012 **Req'd Oty:** 1.00

01/10/2012 Start Qty: 1.00

QC8- Inspect parts - second check

**Cust Item ID:** 

**Customer:** 

Reference:

Approvals:

Process Plan: Date: Tooling:

Date: \_\_\_\_

Run

QC: \_\_\_\_ Date: \_\_\_ SPC (Y/N):

Date:

Sequence ID/ Work Center ID Operation **Description** 

Set Up/ **Run Hours** 

Tool ID

Tool # Plan Code

Accept Qty

Reject Reject Qty

Insp. Number Stamp

\*140\*

140

Memo

0.00

0.00

TW 12-10-4

Quality Control

145

Crosstubes

Memo

0.00

0.00

Crosstubes

GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

12-10-4

150

\*150\*

HandFXtube

Hand Finishing Crosstubes

Memo

0.00

0.00

1- PRESSURE WASH X-TUBE INSIDE AND OUT

2- ACID ETCH X-TUBE INSIDE AND OUT. USE RED SCOTCH BRITE

RM 12-10-9

										DO	QA:	_ Date	:
NCR: Y	'es / No				WORK ORDER NON-	COI	NFORM	MANCE / UP	DATE	QA Clos	 ed:	 Date	:
	<del></del>				DISPOSITION				AGAINST D				
Work Orde				<del></del>	Rework	]		Skid-tube	Crosstube			Water Jet	Engineering Quality
	lo			<del></del>	Scrap Use-as-is		Thern	Machining noforming	Small Fab Finishing	_		Eng. Coor/Packaging	Other
NCR N	lo		······································		Work Order Update			Large Fab	Composite			Supplier	
Root				Descri	ption of work order update		nitial	Ac1	tion	Sign 8			
Cause	Date	Step	Qty		or Non-conformance	Ch	ief Eng	Desci	ription	Date		Verification	QC Inspector
Doc/Data													
Equip/Tooling													
Operator													
Material													
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Other													
Process													
Supplier													
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	<del> </del>			···		AUL	T CATE	GORY					
Landin	g Gear			<del></del>	General		1		_	٦		_	٦,
	Bending	_			Bend	_	Grain		-	Ovalized		, -	Pressure/Forced
-	Centre No	ot Concer	ntric to C	<sup>D/S</sup>	BOM/Route	$\vdash$	Hardwa		<u> </u>	Over/Un		lerance	Temperature/Cure
-	Cracks				Broken/Damaged	-		on Incomplete		Part Inco		.	Weld
-	Crushed/	Crimped.			Burrs	$\vdash$	1	ions Incomplete/U	Unclear	Part Lost		ing _	Wrong Stock Pulled
-	Cuffs			-	Contamination	-	Mainte		-	Part Mo			
-	Heat Trea			<u> </u>	Countersink	<u> </u>	Mislabe		<u> </u>	Position			704
	Inspection	•	Tube	<u> </u>	Cut Too Short		Misread	I	L	Power L	oss/Su	rge	Other
-	Ripples in				Drill Holes	1	Offset						<del> </del>
l l	Torque W	aves in E	xtrusion	1	Drawing	1	Out of C	Calibration					

Out of Sequence

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

Quality Control

October-01-12 3:30:09 PM Item ID: D212-664-201TRN Accept \*N900040100\* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail Start Qty: 1.00 **Start Date:** 01/10/2012 **Cust Item ID: Required Date:** 16/10/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Process Plan: Approvals: Date: **Tooling:** Date: Stop QC: Date: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ **Tool ID** Tool # Plan Accept Reject Reject Insp. **Work Center ID** Description **Run Hours** Code Qty Qty Number Stamp 160 QC5- Inspect part completeness to step on W/O 0.00 \*160\* 0.00 Memo Quality Control 170 0.00 Packaging \*170\* 12-10-10 Packaging 0.00 Memo Packaging Identify and stock in kanban rack Location: 180 QC21- Final Inspection - Work Order Release 0.00 \*120\* 0.00 Memo

NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORI	VIANCE / UF	DATE	QA Closed:	Dat	te:	
Work Ord	or:					DISPOSITION				AGAINST DE	EPARTMENT	/PROCESS		
Part I	No.					Rework Scrap Use-as-is Work Order Update		Machining Small Fa Thermoforming Finishir		Crosstube Small Fab Finishing Composite	ab Prod. Eng. Coo ng Rec/Store/Packagir			Engineering Quality Other
Root			}		Descri	ption of work order update		Initial	Ad	ction	Sign &			· · · · · · · · · · · · · · · · · · ·
Cause		Date	Step	Qty		or Non-conformance	Ch	nief Eng	Desc	cription	Date	Verification	n	QC Inspector
Doc/Data														
Equip/Tooling														
Operator	Ш		1											
Material	Ц		•											
Setup	Ш													
Other	Ш			ì										
Process	Ш													
Supplier	Н													
Training	Н		:									]		
Unapproved			<u> </u>				A 1 11	LT CATE	CORV		<u> </u>			
Landi	ng G					F General	AUL	LICATE	JUNT					
Lattu	<u> </u>	Bending			F	Bend		Grain		Г	Ovalized			ressure/Forced
	-	Centre No	nt.Concer	atric to C	)/5	BOM/Route	$\vdash$	Hardwa	re	-	Over/Under	tolerance	—	emperature/Cure
	-	Cracks	or concer		"	Broken/Damaged		4	on Incomplete	<u> </u>	Part Incorre		⊢—	Veld
		Crushed/0	Crimped			Burrs		- ·	ions Incomplete,	/Unclear	Part Lost/M			Vrong Stock Pulled
	-	Cuffs				Contamination		Mainte			Part Moved			
	П	Heat Trea	t			Countersink		Mislabe	led		Positioned V	Vrong		
	$\square$	Inspection	n Strip in	Tube		Cut Too Short		Misread	I		Power Loss/	'Surge		Other
	-	Ripples in				Drill Holes		Offset		<u> </u>				
		Torque W	aves in E	xtrusion		Drawing		Out of 0	Calibration					
		Turning S	equence			Finish		Out of 9	equence					

Outside Dimensions

DQA:

Date: \_

Wave/Twist in Tube

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

# **Picklist Print**

October-01-12 3:30:13 PM

Work Order ID: 90953

\*90953\*

Parent Item:

D212-664-201TRN

\*D212-664-201TRN\*

Parent Item Name: Crosstube Turning Detail

**Start Date:** 01/10/2012

**Required Date: 16/10/2012** 

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A 08-03-06 new issue DD verified by:ec

IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/ Item Name

Replacement Mfg/ Item ID Purch Bin Primary Item Location

Last Location Route Seq ID

Unit of Measure Hand

Qty on

Qty per Kit Total

**Qty** 

Date Issued Issued

Qty

Status

D6006-129

Manufactured

120

Each

20.0000

\*\*

Crosstube Material

Location Loc Qty Loc Code LG 20 23970 2 26550 3 1 14

\_\_\_\_ mm. L 12/40/62

Page 1

										DQA:	Date	9: <u></u>
NCR: Y	es / No				WORK ORDER NON-	CONF	ORN	MANCE / UP	DATE	OA Classel		
				·	DISPOSITION				AGAINST D	QA Closed: EPARTMENT,		2
Work Orde Part N	0.				Rework Scrap Use-as-is		f Therm	Skid-tube Machining noforming	Crosstube Small Fab Finishing	_	Water Jet d. Eng. Coor. re/Packaging	Engineering Quality Other
NCR N	o			<u>.</u>	Work Order Update	_		Large Fab	Composite		Supplier	
Root Cause	Date	Step	Qty		ption of work order update or Non-conformance	Init Chief	tial f Eng		tion ription	Sign & Date	Verification	QC Inspector
Doc/Data quip/Tooling Operator Material Getup												- 41/14) 
Other Process Supplier Training Unapproved												
					F	AULT	CATE	GORY				
Landin	<b>g Gear</b> Bending				<b>General</b> Bend	П	rain		, Г	Ovalized	Γ	Pressure/Forced
<u> </u>	Centre No Cracks Crushed/0		ntric to (	o/s	BOM/Route Broken/Damaged Burrs	H:	ardwa specti struct	on Incomplete ions Incomplete/I	. <sup>p.</sup>	Over/Under Part Incorre Part Lost/M	ct issing	Temperature/Cure Weld Wrong Stock Pulled
	Cuffs Heat Trea Inspection		Tube		Contamination Countersink Cut Too Short	Шм	lainte Iislabe Iisread		-  -	Part Moved Positioned V Power Loss/	Wrong	Other
<u></u>	Ripples in Torque W	Bend aves in E		1	Drill Holes Drawing		ffset ut of C	Calibration	``			
-	Turning So Wave/Tw		e e	-	Finish Folio	<del></del>		equence Dimensions				

DART AEROSPACE LTD	Work Order:	90953
Description: Crosstube Assembly (205/212 High Aft)	Part Number:	D212-664-241
		j.
Inspection Dwg: D212-664-241 Rev: D		Page 1 of 2

# FIRST ARTICLE INSPECTION CHECKLIST

	spection Sheet wing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments	
	0.200	+/-0.010	,200			vern	Cric-os	
	R0.063	+/-0.010	.063	(		R6		
	2.990	+0.005/-0.000	2.99/	/		vern	cwc-08	
	5.237	+/-0.030	5.237	/		1	00000	
	2.600	+0.005/-0.000	2-663	/				
	2.686	+0.005/-0.000	2-688	/		5. 1		
ΕA	2.770	+0.005/-0.000	2.775	/				
SIDE	2.854	+0.005/-0.000	2.858					
0,	2.938	+0.005/-0.000	2941					
	3.021	+0.005/-0.000	3022	-				
	3.133	+0.005/-0.000	3.135					
	3.179	+0.005/-0.000	3.179			1		
	0.200	+/-0.010	202					
	R0.063		- 200			vern	CNC-06	
		+/-0.010	.063			RG		
	2.990	+0.005/-0.000	2.990	//		vern	coud	
		+/-0.030	5.261					
	2.600	+0.005/-0.000	2.603			17. Sept.	43	
	2.686	+0.005/-0.000	2.691 3		t de			
Ш	2.770	+0.005/-0.000	2.775					
SIDE	2.854	+0.005/-0.000	2.858	//				
0,	2.938	+0.005/-0.000	2.943					
ļ	3.021	+0.005/-0.000	3.022					
	3.133	+0.005/-0.000	3-135					
4.	3.179	+0.005/-0.000	3,186	_~				
	124.362	+/-0.020	124.360			tope	L6-22	
						, 0		
	W. A. S. B.							

											DQA:	Dat	e:
NCR:	Yes / 1	10				WORK ORDER NON-C	O	VFOR	MANCE / UP	DATE	QA Closed:	 Dat	e:
						DISPOSITION				AGAINST DE			
Work Orde	er:						,		<del></del> 1	·	7	_	
Part N						Rework Scrap Use-as-is Work Order Update		Skid-tube Crosstube Machining Small Fab Thermoforming Finishing Large Fab Composite		Finishing	Water Jet Prod. Eng. Coor. Rec/Store/Packaging Supplier		Engineering Quality Other
	···—				<del></del>		,						
Root					Descri	ption of work order update	1	nitial	Ac	tion	Sign &		
Cause	Da	e St	ер	Qty	C	or Non-conformance	Ch	ief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data													,
Equip/Tooling													
Operator		Ì	1										
Material													
Setup													
Other													
Process													
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Unapproved	<u> </u>		l			-		TCATE	CORY		<u>. L</u>	<u> </u>	
						General	AUL	T CATE	GURY				
Landii	n <b>g Gear</b> Bendi	~~				Bend		Grain			Ovalized	F	Pressure/Forced
		ng e Not Co	ncon	tric to	~/s	BOM/Route	$\vdash$	Hardwa	ro		Over/Under	tolerance	Temperature/Cure
	Crack		ncen	יטי	),3  -	Broken/Damaged	$\vdash$	4	ion Incomplete		Part Incorre	t t	Weld
	_	ed/Crim	ned	_	-	Burrs	-	4 `	ions Incomplete/	Unclear	Part Lost/Mi	- t	Wrong Stock Pulled
	Cuffs	eu/ ci iii	peu.			Contamination	$\vdash$	Mainte	•		Part Moved		
	Heat	[reat				Countersink		Mislabe			Positioned V	Vrong	
	<b>⊣</b>	ction Stri	in in 1	Tube	<u> </u>	Cut Too Short	$\vdash$	Misread		-	Power Loss/	· ·	Other
	<b>—</b>	s in Ben			<u> </u>	Drill Holes	$\vdash$	Offset	-	<b>L</b>	J. 21101 2300/	·· o -	
	<del></del>	e Waves		ctrusio	,	Drawing	$\vdash$	4	Calibration				

Out of Sequence

Outside Dimensions

Turning Sequence

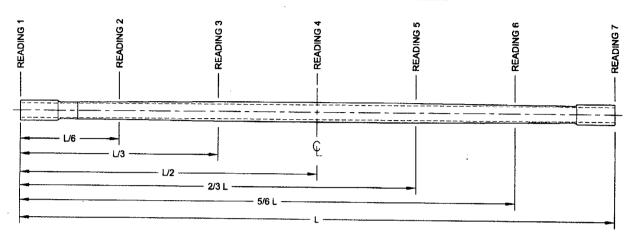
Wave/Twist in Tube

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	90953
Description: Crosstube Assembly (205/212 High Aft)	Part Number:	D212-664-241
Inspection Dwg: D212-664-241 Rev: D		Page 2 of 2

# WALL THICKNESS MEASUREMENT



	WALL	THICKNESS	Deviation			
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE
READING 1 L= 0"	, 400	.381	.378	.400	,022	
READING 2 L= 20.727	.323	302	.298	.31878	.025	
READING 3 L= 41.454	.483	.480	.473	.478	.010	
READING 4 L= 62.181	524	.522	.514	.522	.010	0.062"
READING 5 L= 82.908	. 485	.475	.473	. 483	.012	
READING 6 L= 103.635	.322	.300	.300	.322	.022	
READING 7 L= 124.362	,404	.386	.374	.393	.030	

# **Calibration Result**

Actual Block Thickness: 250 - 200

Sitescan 250 Measured Thickness: 1250-166

Measured by:	KC	Audited by: Tu)	Preliminary Approval:
Date:	12-10-04	Date: 12-10-4	Date:
Rev Date	Change		

Rev	Date	Change	Revised by Approved
Α	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM
В	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM
С	07.05.08	Dwg Rev. updated	KJ/JLM
D	10.08.03	Dimension 124.362 was 124.36	KJ /O IA
Е	12.06.04	Wall thickness form added	KJ 🗱

												DQA:	υa	te:	
NCR:	Yes	/ No				WORK ORDER NON-	COI	NFORM	ΛANCE / UP	DATE		QA Closed:	 Da	ite:	
				<u> </u>		DISPOSITION				AGAINST		PARTMENT		<u> </u>	
Work Ord	er: _					Rework	7		Skid-tube	Crosstube	—	1	Water Jet		Engineering
Part f	No.			Scrap Machining Small						Small Fab		Prod. Eng. Coor. Quali			
NCR I	No.					Use-as-is Work Order Update	}		Large Fab	Finishing Composite		Rec/Stor	e/Packaging Supplier	-	Other
Root					Descri	ption of work order update		Initial	Ac	tion		Sign &			
Cause		Date	Step	Qty	(	or Non-conformance	Cł	nief Eng	Desc	ription		Date	Verificatio	n	QC Inspector
Doc/Data									İ						
Equip/Tooling									I						
Operator									I						
Material									I						
Setup									İ					,	
Other									1					1	
Process	П								1				•		
Supplier								1							
Training							1							1	
Unapproved															
						F	AUI	T CATE	GORY						
Landi	ng G	iear				General	_	_				-			Ī
	Ш	Bending				Bend	L	Grain		į		Ovalized		L	Pressure/Forced
		Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re			Over/Under	tolerance		Temperature/Cure
. •		Cracks				Broken/Damaged		Inspecti	on Incomplete			Part Incorred	ct		Weld
		Crushed/	Crimped.			Burrs		Instruct	ions Incomplete/	Unclear		Part Lost/Mi	ssing		Wrong Stock Pulled
	Cuffs Contamination						Mainte	nance		Part Moved					
	П	Heat Trea	t			Countersink	Mislabeled			Positioned Wrong		_			
	П	Inspection	n Strip in							Other					

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		Х	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC, 299-947-100 TYPE II, CLASS 2 ADHESIVE)

#### **GENERAL NOTES:**

- 1) MATERIAL: MANUFACTURED FROM D6006-129
- FINISHED LENGTH = 124.362±0.020 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
- PAINT OUTSIDE PER DART QSI 005 4.2 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
- D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHELLCOPY RETERNTO ENGINEERING TIMEORTROLLED COPY SUBJECT TO AMENDMENT

WITHOUT NOTICE WORK ORDER MLJ

6CU \$11-614

12-10-0 UNDER REVIEW

DEO ATTACHED

D	REORG TO CUI REMOV C6-3 &	ANIZED VIEV RRENT STANI (ED REF & AD A8-3); RELOC MOVED TURN	GENERAL NOTES/PART LIST; VS AND REFORMATTED DRAWING OARDS; ADD -241B (ZN D4-2, B4-2); D TOLERANCES (ZN D8-3 & C4-3, ATED FLAG #6 PER PAR 08-046 (ZN ING DETAIL & UPDATED TOLERANCE	RF	09.09.30		
С			RASION STRIP; ADD MAGNOBOND VERSE CLAMPS	PH	07.03.08		
В	ADD H SKIDT	OLES FOR C	PH	05,02.04			
Α	NEW IS	SSUE		PH	00.12.12		
REV.			DESCRIPTION	BY	DATE		
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CHECK	ED	P		REV. D			
MFG. AF	PR.	77	D212-664-241	5	HEET 1 OF 4		
APPRO	VED	10	TITLE		SCALE		
DE APP	APPR. CROSSTUBE ASS'Y (205/212 HI AF						

DATE

09.09.30

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В

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											QA Clo	sed:	Dat	te:	
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ſ	Пне	eat Trea	t			Countersink		Mislabe	eled		Positioned Wrong				
	Inspection Strip in Tube Cut Too Short					Cut Too Short	Misread Power Loss/Surge Other					Other			

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

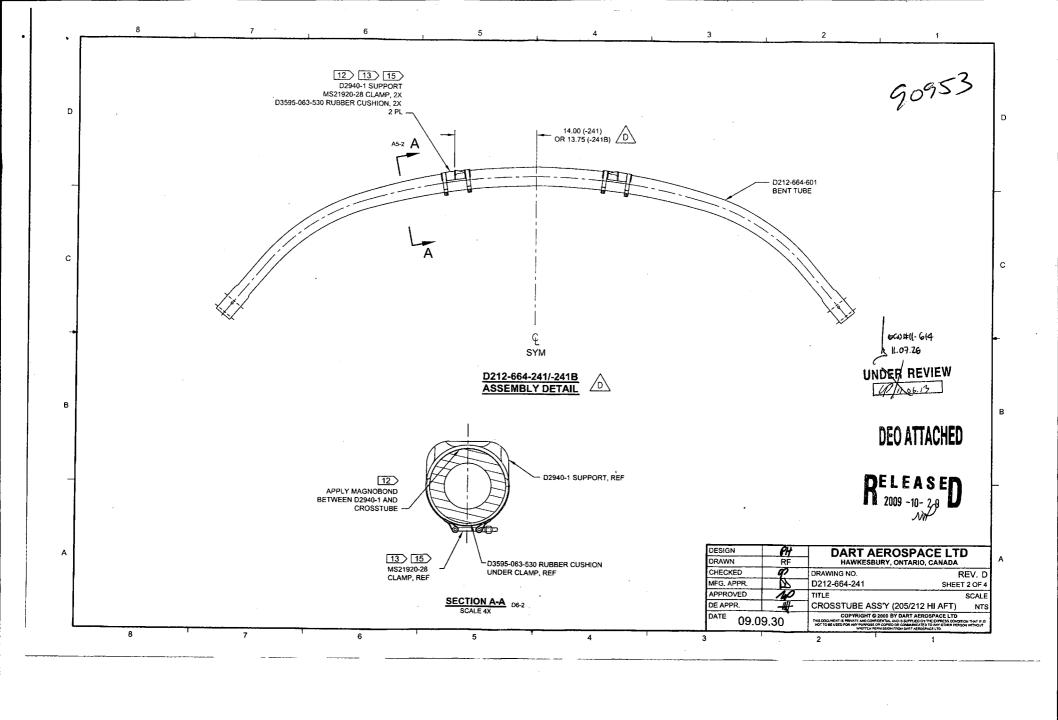
Torque Waves in Extrusion

Drill Holes

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



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Out of Sequence

Outside Dimensions

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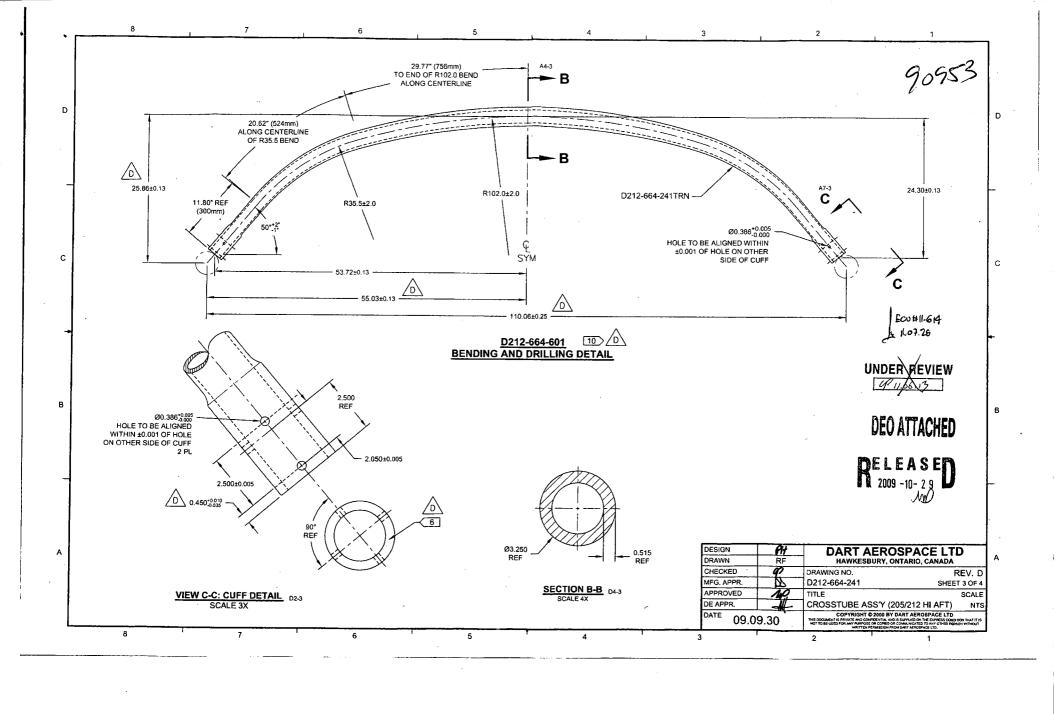
Date:

Turning Sequence

Wave/Twist in Tube

Finish Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



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Out of Calibration
Out of Sequence

Outside Dimensions

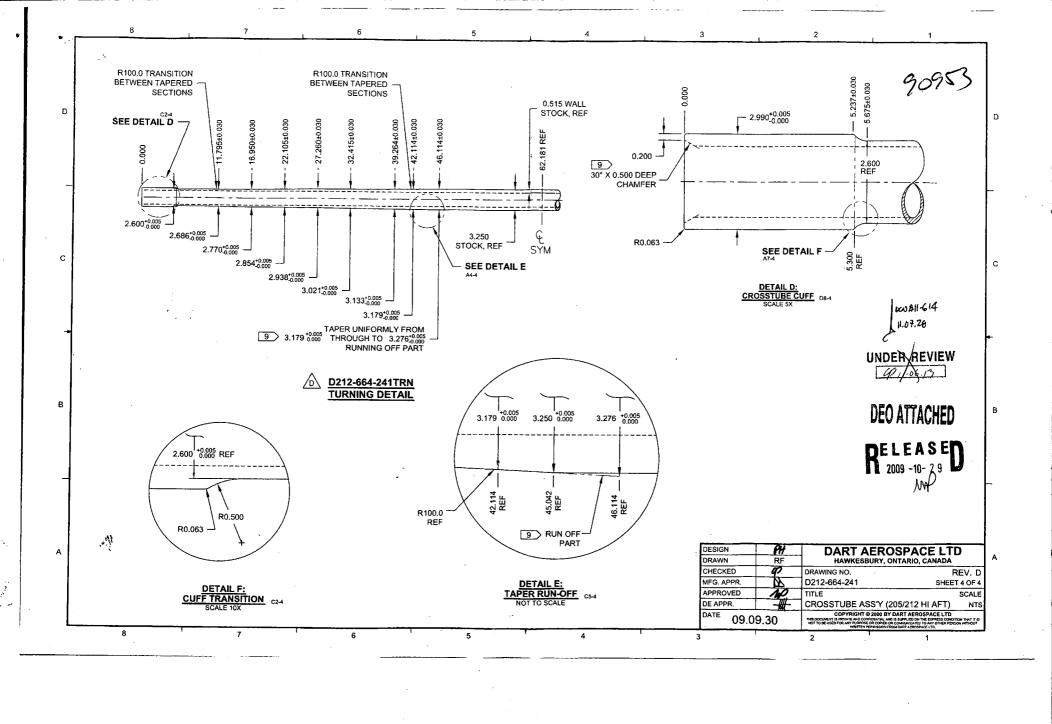
Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish



NCR:	Yes / No				WORK ORDER NON-	COI	NFORM	MANCE / UPDATE		•		_	
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Out of Sequence

Outside Dimensions

DQA:

Date:

Turning Sequence

Wave/Twist in Tube

Finish Folio

DRAWING NO.	TITLE		AEROSPACE LTD	D.E.O. NO.	SHEET NO.	SCALE
D212-664-241	CROSSTUBE ASSY (205/212	HI AFT) ENGIN	IEERING ORDER	D212-664-241-D-1	SHEET 1 OF,2	NTS
DRAWN K	CHECKED	MFG. APP	R. B	APPROVED MP	DE APPR	
DATE 11.04	.07 DATE	DATE	11.04.12	DATE 11/04/12	DATE 11.04.12	

**PURPOSE:** 

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

<u>IS:</u>

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND

PAINT OUTSIDE PER DART QSI 005 4.2 REMOVE MASKING AND APPLY CLEAR COAT

WAS:

2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2

PAINT OUTSIDE PER DART QSI 005 4.2

2011 -04- 18P

UNDER REVIEW

BCV#1-614

11.07.20

											DQA:	Da <sup>1</sup>	te: _	
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					i						QA Closed:	Da	te:	
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					Use-as-is	1	Therm	noforming	Finishing		Rec/Stor	e/Packaging		Other
NCR N	No				Work Order Update			Large Fab	Composite			Supplier		
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Ī	Inspectio	n Strip in	Tube		Cut Too Short		Misread				Power Loss/	Surge		Other
Ī	Ripples in	Rend			Drill Holes		Offset		_					

Out of Calibration

Out of Sequence

Outside Dimensions

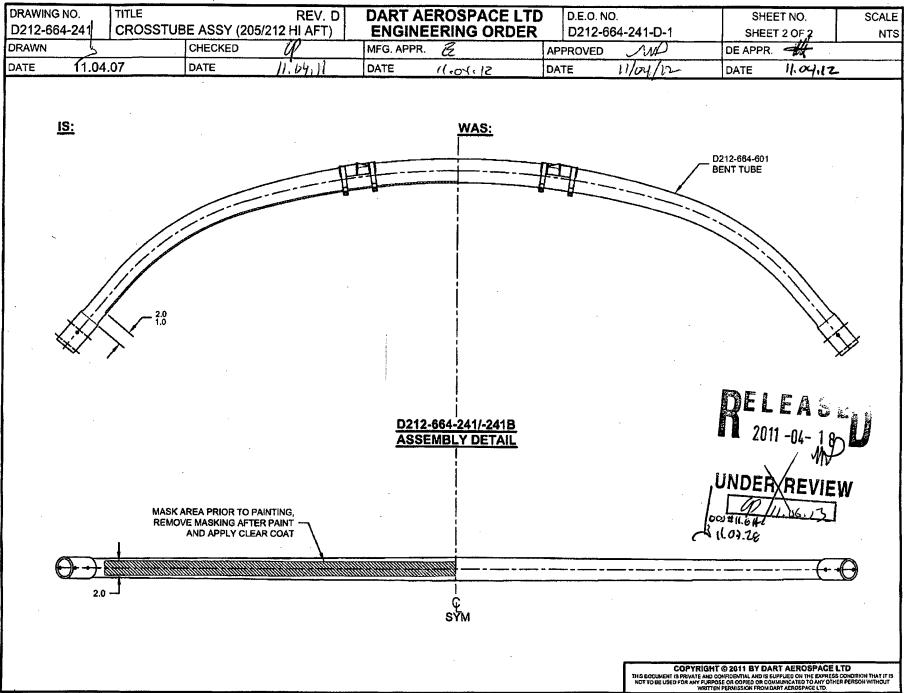
Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



NCR:	res /	No				WORK ORDER NON-C	ON	IFORI	MANCE / UPD/		QA Closed:	Date	
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						Use-as-is			noforming	Finishing	Rec/Stor	e/Packaging	Other
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Out of Calibration

Out of Sequence

Outside Dimensions

DQA:

Date:

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

90953

DRAWING NO.	TITLE	REV. D	DART AE	ROSPACE LTI	D.E.O. N	IO.	SHEET NO.	SCALE	
D212-664-241   CROSSTUBE ASS'Y (205/212 HI AFT)			ENGINE	ERING ORDER	D212-6	64-241-D-2	SHEET 1 OF 1	NTS	
DRAWN	P	CHECKED AS	MFG. APPR.	/%	APPROVED	M	DE APPR.		
DATE 11	.07.15	DATE 11.07.20	DATE	1107.21	DATE	11/27/21	DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

## **CHANGE:**

IS

item	Qty -241	Qty -2418	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

### WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023
				ADHESIVE (TEXTRON/BELL SPEC. 299-947-100,
				TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

### IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

#### WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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W. J. O. J.					DISPOSITION  Rework  Scrap  Use-as-is  Work Order Update		AGAINST DEPARTMENT/PROCESS								•	
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	Centre Not Concentric to O/S			BOM/Route Broken/Damaged			Hardwa	re			Over/Under	tolerance		Temperature/Cure		
							Inspection Incomplete				Part Incorred	ct		Weld		
				Burrs	- <u>-</u>		Instructions Incomplete/Unclear				Part Lost/Mi	ssing		Wrong Stock Pulled		
	Cuffs	•			Contamination		Г	Maintenance				Part Moved				
	Heat Trea	t			Countersin	ık		Mislabe				Positioned Wrong				
İ	Inspection Strip in Tube			Cut Too Short			Misread				Power Loss/Surge Other			Other		

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

Drawing

Finish